

Port Sustainability and Stakeholder Management in Supply Chains: A Framework on Resource Dependence Theory

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Abstract

Although sustainability is a topical concern in ports and the supply chain literature, the main focus of the academic research has been on the environmental dimension of sustainability rather than the social and economic dimensions. Since ports are indispensable nodes of supply chains involving many strategic stakeholders and activities interacting with each other, investigating the contribution of stakeholder relations on ports sustainability has emerged as a major concern. The main aim of this study is to provide a conceptual framework integrating the organizational relationships between supply chain and port stakeholders based on the theoretical background concerning the strategic management and the socially responsible marketing. This study attempts to identify the influence of supply chain stakeholders on sustainability of ports by considering the propositions of interdependencies, power imbalances, and strategic options within resource dependence theory. While this paper can be regarded as a review of port sustainability literature, the uniqueness lies on the consideration of the concept from the basis of resource dependence theory. Conceptual framework of this study suggests that ports should adopt strategies as insertion, integration and dominance for the management of interdependencies through the adoption of strategic tools to enhance effective stakeholder relations management and port sustainability.

Key words : Port sustainability, supply chain, stakeholder, resource dependence theory

I. Introduction

Despite the increasing interest in the social factors of sustainability as stakeholder management, corporate social responsibility, ethical behavior, social dimension of port sustainability has not been well-defined and it received little attention in the literature. As a number of forces drive companies to obtain a higher level of corporate social responsibility, many firms have decided to become more involved in social issues and factors by taking a broader view of their stakeholder relations.¹⁾ The key to establishing triple bottom line principle of sustainability (social, economic and environmental dimensions), which gained considerable recognition by both academicians and practitioners in marketing and management disciplines specifically, is stakeholder consultation and involvement in port related decisions.²⁾ In the light of this, the main objective of this research is to demonstrate a conceptual framework related to port-supply chain stakeholder relations based on interdependence, strategic options and tools as the main propositions of resource dependence theory. Hence, this review paper intends to fill the gap in port sustainability literature by the investigation of stakeholder interrelations from a unique theoretical approach, namely resource dependence theory.

Although the supply chain management is mainly the broader concept including the series of companies including suppliers, customers and logistics service providers that work together to deliver a value package of goods and services to the end-customer,³⁾ the sustainability of the supply chain is dependent on the sustainability of ports. Significant role of ports for supply chain sustainability comes from the inherent interrelationships between ports with the main actors such as port authorities, terminal operators, etc.⁴⁾

Sustainability and stakeholder concepts are discussed within the scope of the key issues, supply chain and ports highlighting the social dimension of sustainability and particularly the stakeholder interrelations. As the theoretical background of this study, resource dependence approach is borrowed in order to discuss the supply chain stakeholders' relations of ports in accordance with the related propositions of the theory as interdependence, power balances and strategies. A conceptual framework illustrating port and supply chain

1) Kotler and Keller (2012).

2) Elkington (1998).

3) Simchi-Levi, Kaminsky and Simchi-Levi (2002).

4) Jacobs and Hall (2007), p.330.

stakeholders, interdependencies, relative power balances and strategic options is suggested.

II. Literature Review

1. Sustainability and Sustainable Supply Chain

Sustainability is defined as “*the development that meets the needs of the present without compromising the ability of future generations to meet their needs*” by Brundtland Commission.⁵⁾ Sustainability concept has an interdisciplinary nature that it was studied in many academic research in different fields such as environmental sciences, social science, engineering, agriculture and biological science, economics, business and management.⁶⁾ Within this extended focus of the academic research on sustainability, supply chain concept and supply chain sustainability have also gained importance. A unified definition of a sustainable supply chain is provided as “*the management of supply chain operations, resources, information, and funds in order to maximize the supply chain profitability while at the same time minimizing the environmental impacts and maximizing the social well-being*”.⁷⁾

Triple bottom line principle which focused on the integration of environmental, social and economic performance was recognized as three pillars of sustainability as well as sustainable supply chains.⁸⁾ As one of the pillars of the sustainable supply chain concept, social factors play an important role in determining the impact of the companies’ and supply chains’ operations on the society. Although there is more concern regarding the economic outcomes of businesses and supply chains, society has some other expectations such as social outcomes for businesses. The main reason behind the negligence could be due to the fact that societal concern of the sustainability concept is difficult for organizations to apply since there is a lack of guidance regarding how organizations can effectively balance organizational responsibilities to the stakeholders.⁹⁾

In line with the intent of the study as integrating supply chain and port

5) World Commission on Environment and Development (1987), p.8.

6) Linton, Klassen and Jayaraman (2007).

7) Hassini, Surti and Searcy (2012).

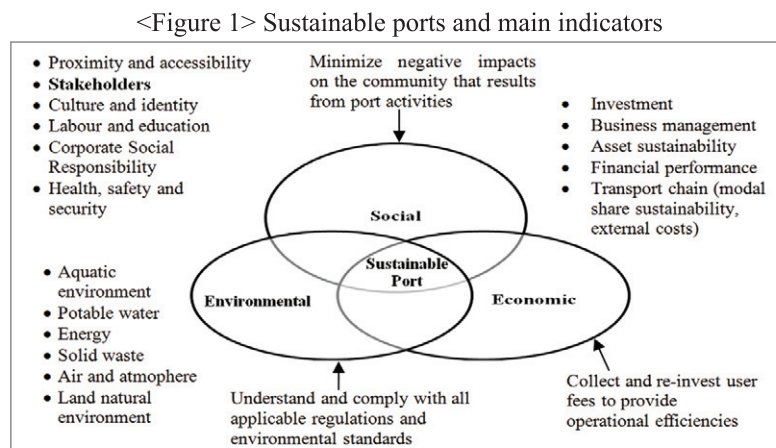
8) Markley and Davis (2007).

9) Carter and Rogers (2008).

sustainability from the social dimension and stakeholder relations on the basis of resource dependence theory and with the belief that supply chain sustainability can not be maintained without ensuring port sustainability since ports are the vital and central links within complex supply and logistics chains,¹⁰⁾ following part focuses on the sustainability of port systems.

2. Port Sustainability

Ports as organizations having an important role in integrating their operations with their supply chains need to adopt themselves to the requirements of this changing business environment where sustainability concept gained considerable recognition.¹¹⁾ Port sustainability is defined as “*business strategies and activities that meet the current and future needs of the port and its stakeholders, while protecting and sustaining human and natural resources.*”¹²⁾ Social dimension has basically been considered from the view point of stakeholder relationships of ports. In their earlier research on port stakeholder relationships, the relationship between different stakeholders of landlord ports by demonstrating how various stakeholders are positioning themselves from the view point of Stakeholder Relations Management(SRM) are investigated.¹³⁾ It is argued that sustainability performances of ports will vary from port-to-port even if a universal sustainability framework is adopted.¹⁴⁾



Source: Adopted from Blume(2009) and Covil(2012)

10) Banister, Capello and Nijkamp (1995).

11) Lu, Shang and Lin (2012).

12) AAPA (2007).

13) Notteboom and Winkelmans (2002); Winkelmans and Notteboom (2007).

14) Goldman (2007).

This shows that a single and a structured framework for port sustainability in general terms may be successful for the port management and the stakeholders to implement the basic concepts and determine the performance levels. Apart from the studies related to the social factors of port sustainability, very limited research attempted to identify the main indicators of port sustainability. Crucial sustainability assessment criteria are identified by a survey study including major international ports in Taiwan.¹⁵⁾ Under the “Appraising Port Sustainability-SuPort” project 82 indicators of port sustainability which are classified under environment and natural resources, society and economics are also listed.¹⁶⁾ Figure 1 shows the port sustainability concept based on the triple bottom line principle.¹⁷⁾ Since the main scope of this paper is on the stakeholder relationships of ports by considering the resource dependence theory, the social dimension of port sustainability focusing on the stakeholder concept and interactions will be discussed in the following sections.

III. Theoretical Perspective: Resource Dependence Theory

The resource dependence model proceeds from the indisputable open-systems proposition that organizations are not able to internally generate all the resources required to maintain themselves, and therefore organizations depend one another for their survival and thus interact with each other with their own interest¹⁸⁾ and must enter into transactions and relations with elements in the environment that can supply the required resources and service.¹⁹⁾

The basic proposition of resource dependence theory is the notion that a firm’s need for resources provides opportunities for others to gain control over it.²⁰⁾ Organization is treated as a coalition of individuals where each related party seeks to satisfy its own interests and goals.²¹⁾

One arena that interorganizational relations or dependencies take place is

15) Lu, Shang and Lin (2012).

16) Covil (2012).

17) Covil (2012); Blume (2009).

18) Katz and Kahn (1978).

19) Aldrich and Pfeffer (1976), p.83.

20) Froeman (1999).

21) Cyert and March (1963).

resource procurement and allocation²²⁾ that are vital for the organizational survival and sustainability. Since the environment is considered as a stock of resources from the resource dependence approach, many researchers²³⁾ investigated the concept of “dependence” between interacting organizations. One of the main themes of this theory is interdependency of the stakeholders where the others are power and strategic options.²⁴⁾

However, the construct “interdependence” in resource dependence theory covers *power imbalance* and *mutual dependence*.²⁵⁾ Resource dependence theory predicts that organizations will be powerful relative to others to the extent that they (1) control resources needed by others and (2) can reduce their dependencies on others for resources.²⁶⁾

“Dependence” is defined as a state in which one actor relies on the actions of another to achieve particular outcomes.²⁷⁾ Three types of interdependence are distinguished among horizontal interdependence, symbiotic interdependence and vertical interdependence.²⁸⁾ Where horizontally interdependent organizations are typically structurally equivalent, symbiotically related organizations complement each other in rendering services to one another and vertically interdependent firms are viable transactional partners.²⁹⁾ Additionally, from a supply chain management network perspective, the interdependence between supply chain stakeholders into three categories as; *sequential/serial interdependence* (unidirectional relationship between the activities of stakeholders), *pooled interdependence* (stakeholders share the same resources and are indirectly interdependent) and *reciprocal interdependence* (mutual exchange of input and output between two stakeholders) is mentioned.³⁰⁾

Since the rights to control resources that generate dependencies are transferred to the merged entity,³¹⁾ mergers and acquisitions have been among the primary concerns of interorganizational activity. Horizontal and vertical mergers, joint ventures, co-optation, movement of personnel

22) Galaskiewicz (1985), p.282.

23) Salancik (1979); Galaskiewicz (1985); Frooman (1999).

24) Pfeffer and Salancik (2003).

25) Casciaro and Piskorski (2005).

26) Provan, Beyer and Kruijtbosch (1980), p.201.

27) Pfeffer (1982).

28) Pennings (1981), p.434.

29) Galaskiewicz (1985), p.287.

30) De Martino and Morvillo (2008), p.579.

31) Casciaro and Piskorski (2005).

among organizations, diversification, board of directors' ability to provide critical resources to the firm, engaging in political action and the success of executives to cope with the critical problems facing the organization are considered as the strategies by which the organization attempts to restructure the conditions of interdependence with the stakeholders in its environment.³²⁾ Mutual dependence stimulates merger and acquisitions, whereas power imbalance curtails them.³³⁾

IV. Stakeholder Influences and Strategies for Port Sustainability

Stakeholder is defined as "any group or individual who is affected by or can affect the achievement of an organization's objectives."³⁴⁾ Unlike traditional management; stakeholders among, internal stakeholders, external stakeholders and interface stakeholders are distinguished.³⁵⁾ Staff employees and middle managers are examples of *internal stakeholders*. The local community, federal government, suppliers, competitors and customers are included in *external stakeholders*. A corporation's board of directors and its auditors typify *interface stakeholders*. Another stakeholder classification is among primary and secondary stakeholders. *Primary stakeholders* are those who have formal, official, or contractual relationships and have a direct and necessary economic impact upon the organization. *Secondary stakeholders* are defined as those who influence or affect, or are influenced or affected by, the corporation, but they are not engaged in transactions with the corporation and are not essential for its survival.³⁶⁾

The importance of stakeholder approach in supply chain management is based on the definition of the supply chain and the growing interest in sustainable supply chains over a decade has mainly been due to the pressures from various stakeholders, especially government regulators, community activists, non-governmental organizations (NGOs) and global competition.³⁷⁾

32) Pfeffer and Salancik (2003), p.113.

33) Casciaro and Pikorski (2005).

34) Freeman (1984), p.46.

35) Savage, Nix, Whitehead and Blair (1991), p.62.

36) Clarkson (1995), p.106.

37) Hassini, Surti and Searcy (2012).

Government, customers and various stakeholders are considered as the main actors that motivate firms to incorporate sustainability factors into their supply chain management schemes.³⁸⁾ Ports are important members of supply chains in which different logistics and transport operators are involved in bringing value to the final customer.³⁹⁾ Coordination and cooperation is needed at ports and this coordination and cooperation may be considered from the view point of ports' relationships and interactions with its stakeholders. As the competition increasingly taking place between complete transport and supply chains instead of between ports,⁴⁰⁾ the success and thus the sustainability of a port is increasingly being determined by the management of various different and often conflicting interests and objectives of port stakeholders.

Four stakeholder groups in port community are presented as follows⁴¹⁾:

- *Internal stakeholders*: parties inside the port authorities' organizational boundaries such as managers, employees, board members, shareholders, unions.
- *External stakeholders*: two main groups as; parties that invest directly and indirectly in the port area. The first group includes terminal operators, stevedoring companies, forwarders, shipping agencies, industrial companies in the port area, supporting industries such as ship repairers and port labor pools, the second group consists of port customers, trading companies, importers/exporters.
- *Legislation and public policy stakeholders*: government departments responsible for transport and economic affairs, environmental departments and spatial planning authorities.
- *Community stakeholders*: civil society organizations, the general public, the press and the other non-market players.

These groups of stakeholders can also be grouped into two as internal stakeholders and the remaining three stakeholder groups as external stakeholders of the port. Within groups of port stakeholders, impact of external stakeholders on the port management is discussed and it is mentioned that a port authority should cope with the externalities port activity causes.⁴²⁾ Meeting the objectives of external stakeholders at the port has been considered as an important way to secure the viability of long term port

38) Sharfman, Ellington and Meo (1997).

39) Panayides and Song (2008).

40) De Langen and Chouly (2004).

41) Notteboom and Winkelmans (2002).

42) Goss (1990).

development plans which may contribute to sustainable port development.⁴³⁾ Within the scope of this study, the main focus is on the external stakeholders of ports which constitute the supply chain stakeholders influencing ports.

1. Port and Supply Chain Stakeholder Relations and Influences

Ports are represented as networks of actors that carry out a number of activities in the supply chain in close collaboration and by sharing different resources. The sustainability of an organization in a supply chain is dependent on effectively employment of its resources, so it is for the ports as the vital links within logistics networks and supply chains. The main resources at ports are determined as port infrastructure and superstructure elements, equipment and information and communication technologies, financial assets and human capital.⁴⁴⁾

Critical assets that are indispensable, unique and scarce will provide the basis for chain power; for value generation to the entire chain and for sustainability. Another point is creating interorganizational linkages like alliances and acquisitions to ensure that customers' needs are met. In accordance to the resource dependence theory, the association between resources and organizational relationships can be stated such that, the interorganizational relationships between ports and supply chain stakeholders can be considered to be the most relevant strategic resources as they allow ports to access to other stakeholders' resources in the supply chain.⁴⁵⁾ In relation to resource dependence theory, three organizational resources to implement the integration between port and supply chain stakeholders respectively are stated as; (a) financial and human resources, (b) organizational relationship, (c) willingness and support of top management team.⁴⁶⁾

The ability of port to be included in successful networking in and between ports in terms of required foreland and hinterland connections, the ability of port to manage the intervention of green pressure groups, availability of port capacity due to absence or refusal of support by local communities and ability of port to integrate itself into a network of business and community relations are regarded as basic prerequisites for ports' integration in supply chain

43) Dooms, Macharis and Verbeke (2004).

44) Karatas-Cetin and Cerit (2010), p.206.

45) De Martino and Morvillo (2008), p.575.

46) Woo and Pettit (2009), p.17.

sustainability.

The interorganizational linkages between shipping companies and terminal operators are seen as joint ventures, strategic alliances, mergers and acquisitions, consortia and conferences aiming to pool resources to be competitive. However, as port customers, these new formations in maritime industry become more powerful against port authorities. According to the findings of the research conducted by Mindlin and Aldrich,⁴⁷⁾ the dependence between a focal organization and its customer is directly proportional to the percentage of the organization's output consumed by the customer and/or the percentage of the customer's supplies furnished by the focal organization. In this sense, ports that serve to large and powerful shipping lines have a lower bargaining power vis-a-vis these parties and thus will be more strategically dependent on such customers since they provide the main input, financial resource.

2. Strategic Options for Port Sustainability and Supply Chain Stakeholder Influences

The higher the level of coordination and integration among the stakeholders of port and supply chains, the higher the sustainability of the entire supply chain⁴⁸⁾ and for the port. From an economical and societal dimension, a port's sustainable operation is associated with the close coordination with logistics actors outside the port perimeter and integrated approach to port infrastructure and resource planning.⁴⁹⁾ In a study⁵⁰⁾ analyzing a port operator's involvement into an automotive supply chain, it is found out that one of the most relevant management components is organizational relationships between the port operator and the focal firm in the supply chain. Organization interlinkages between port and supply chain stakeholders provide ports with access to critical resources such as technology, markets, capital and knowledge.⁵¹⁾

The motives behind integration strategies between ports and land-side supply chain stakeholders are classified as; demand complementarity, increasing bargaining power vis-a-vis shipping lines, enhancing quality of integrated

47) Mindlin and Aldrich (1975).

48) Carbone and De Martino (2003).

49) Notteboom (2009).

50) Carbone and De Martino (2003).

51) Jacobs and Hall (2007).

logistics services and reducing total logistics costs by shared resources and expertise.⁵²⁾ The quality of port and supply chain stakeholders associations and port-hinterland relations depends on the coordination of actors, including terminal operators, freight forwarders, container operators, and the port authority.⁵³⁾ The strategy of developing port networks with hinterland nodes and dry ports has become widely accepted as a viable strategic option⁵⁴⁾ for the economic and social sustainability of ports.

Port authorities and terminal operators supply chain strategies involve “*insertion strategy*” by attracting lines through concessions or leases, “*integration strategy*” in order to reduce transaction costs and provide more efficient services by offering intermodal transfer possibilities and by effective land use planning⁵⁵⁾ and “*dominance strategy*” in order to capture bargaining power by providing specialized and dedicated terminals and vertical and horizontal integrations. Dedicated terminals as a type of cooperation strategies between port authorities, terminal operators and shipping lines, are a means for port authorities to bind shipping companies to terminals and thus decreasing the bargaining power of these lines certainly if there is competition between different terminal operators⁵⁶⁾ interdependence among port authorities and terminal operators comes from the concession agreements.

V. A Framework for Supply Chain Stakeholder Influences on Port Sustainability

In accordance with the study of Meersman et al.,⁵⁷⁾ two parties as port authorities and terminal operators that constitute main port actors, supply chain and community stakeholders and port service providers and their interrelationships are illustrated. Port supply chain stakeholders’ influences on port sustainability are developed on the basic themes of interdependencies, power imbalances, strategic options within resource dependence theory. Moreover, the selected strategic tools for the management of interdependence

52) Woo and Pettit (2009), pp.10-11.

53) Van der Horst and De Langen (2008), p.109.

54) De Langen and Chouly (2004).

55) Notteboom (2009).

56) Heaver, Meersman and Van de Voorde (2001), p.299.

57) Meersman, Van de Voorde and Vanelander (2009).

and strategic options are borrowed from the shipping and port literature. The conceptual framework of this study is illustrated by Figure 2.

As the first theme, the types of interdependence among each dyad of stakeholders are presented in line with the classifications of Pennings,⁵⁸⁾ Frooman⁵⁹⁾ and De Martino and Morvillo⁶⁰⁾ as horizontal, vertical, pooled and indirect interdependence. As the second theme of the theory, power imbalance in port environment is related to the horizontal and vertical integrations among supply chain stakeholders, particularly shipping lines as the main customers of ports. Resource availability and resource control are the main assumptions that are associated with power and control as well. In port environment, the ports that control the combination of financial, human and organizational relationships as critical assets undertake the power and dominate the supply chain. However, resource availability is inversely proportional to the power and control. The higher the power of port stakeholders, the higher the pressure they apply on ports. This pressure occurs in three basic ways as economic, social and environmental factors in consistent with triple bottom line principle of sustainability. While the supply chain stakeholders that ports engage in business transactions with such as shipping lines, shippers etc. put economic pressures because of their conflicting interest related to their economic objectives, community and public stakeholders exert social and environmental pressures due to negative externalities of ports. Insertion, integration and dominance strategies suggested by Jacobs and Hall (2007),⁶¹⁾ are employed as the third theme of resource dependence theory which constitute the strategic options that stakeholders follow.

Apart from the mentioned constructs represented in the framework, essential components of stakeholder relationship management for the consideration of port authorities are clear statement of mission statement and strategic intent, top managements' abilities and succession in collaborations. As regards the requirements for long-term stakeholder relationships, sharing information and same corporate philosophy, collaborative spirit, mutual trust, keeping stakeholders' common and conflicting interests in manageable level should be considered by ports and their stakeholders. The overall evaluation of

58) Pennings (1981).

59) Frooman (1999).

60) De Martino and Morvillo (2008).

61) Jacobs and Hall (2007).

stakeholder management capability, effective stakeholder communication and consultation, stakeholder involvement in port related decisions, durability and stability of stakeholder relations, stakeholder satisfaction and commitment in stakeholder relations management process may contribute to the achievement of port sustainability.

VI. Conclusion

The main concern of this study is to provide a different perspective for the port sustainability concept with regards to stakeholder relations and influences since organizational interrelationships are regarded as one of the critical assets in the current business environment. The ability of the ports to exploit interorganizational long-term relationships with different supply chain stakeholders is referred as one of the most important prerequisites for the sustainability.

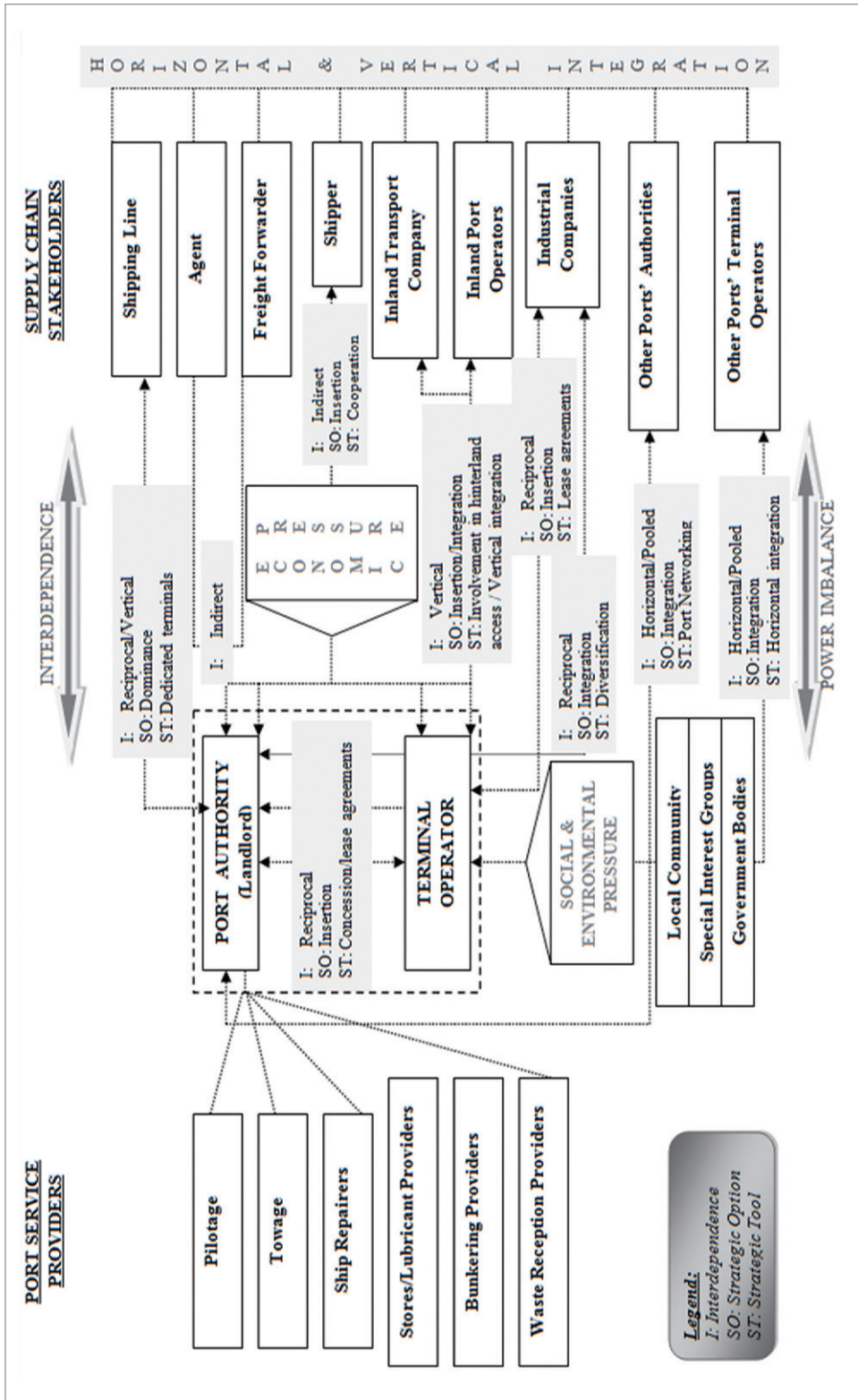
Since this study has a conceptual context in lieu of an empirical research, the outcomes serve to the interests of academic rather than practitioners. Academic contribution of this research is the presentation of a framework showing the supply chain stakeholders' influences on port sustainability with a theoretical basis of resource dependence perspective which has not been discussed in the port and supply chain literature before. Although independently discussed by the recent literature from different disciplines of strategic management, socially responsible marketing, political economy, supply chain, shipping and port business, the constructs are integrated within the framework in order to indicate the organizational interrelationships and strategies. Managerial implications of this study can be considered by port authorities that they should undertake a collaborator and integrator role by developing platforms facilitating collective action and managing common interests of different stakeholders regarding supply chain performance issues, networking and cooperating beyond port boundaries, ensuring information exchange by investing in port community systems and strategically collaborating in supply chain networks for achieving port sustainability and creation of stakeholder value.

As the economical and social dimension of port authorities' roles; promoting the positive externalities of ports to the environmental groups and local communities to assure community support, managing and accommodating common and conflicting interests between port actors and supply chain stakeholders, ensuring that these conflict of interests and external pressures are maintained at a manageable level. A determinative role could be played by the port authority that is called to identify and acquire the critical resources or assets that allow the ports' survival and ensure the balance between the stock of resources and stakeholders in the port environment.

The consideration of the port sustainability concept only from the view point of social dimension can be considered as one of the limitations of this study. Since this research is preliminary with regards to the evaluation of three basic themes from resource dependence theory, further research would involve empirical studies providing an integrated approach of port sustainability with triple bottom line principle. Further research can be suggested both for a single port authority level as well as for multiple ports in order to find out whether there are any significant relationships between the ports' specifications and their interrelations with the stakeholders. Another further research can be conducted for understanding the strategic options and types of interdependencies between port authority and terminal operator and other supply chain stakeholders. Hypotheses tests can be employed by conducting survey research to various port authorities, terminal operators and other port stakeholders in order to reveal port and supply chain stakeholder relations. Considering the strategic importance of resources and relationships for port sustainability, scholars in shipping and logistics research may benefit from the suggested framework as a starting point for the discussion of port stakeholder relationships from resource dependence theory perspective.*

* Date of Contribution ; July 5, 2012
Date of Acceptance ; November 15, 2012

<Figure 2> Conceptual Framework



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